41. ZOOLOGICAL RESULTS OF THE PERCY SLADEN TRUST EXPEDITION TO YUNNAN UNDER THE LEADERSHIP OF PROFESSOR J. W. GREGORY, F.R.S. (1922).

ODONATA.

By F. C. Fraser, Major, I.M.S.

The collection contains nearly 200 specimens of which I have been able to examine about 170.

For want of a better medium, the insects were preserved in some kind of raw native spirit which I fear did not contain any great percentage of alcohol, as most of the specimens have suffered more or less from maceration. By a happy chance however, the rarest and most valuable specimens have suffered the least damage.

As is usually the case where collections of dragonflies are made by those not specializing in them, the majority of the specimens turn out to be *Libellulines*. This is only natural in a dominant sub-family like the *Libellulinae* as the more showy species are apt to force their attentions more pertinently on the collector's attention to the exclusion of less showy and rarer forms.

Very little is known of the dragonflies of Yunnan and existing records are very meagre. Kirby's Catalogue (1890) gives only a single species:—*Mnais andersoni* MacLach., and MacLachlan's list published later (1894) gives only 14 more. It will be useful to recapitulate these and to give a combined list with those collected by Professor Gregory.

The species involved are almost entirely and purely oriental in distribution, only some half dozen being entogenic in the palaearctic region. The paucity of the latter comes as a surprise until one notes that the temperatures recorded were comparatively high (78° to 85° F., at altitudes of 6,000 to 7,000 feet).

In the following list species taken by Professor Gregory are printed in italics:—

1. Agrionoptera sp. MacLach.
2. Libellula basilinea. MacLach.
3. *Orthetrum japonicum internum* Uhl.
4. *Orthetrum cancellatum* Linn. race *kraepelini*. Ris.
5. *Othetrum triangulare melania* Selys.
6. *Sympetrum eroticum ardens* (MacLach).
7. Sympetrum scoticum Don.
8. *Crocothemis servilia* Drur.
9. *Palpopleura sexmaculata* Fabr.

10. *Diplacodes trivialis* (Ramb.).
11. *Brachydiplax yunnanensis*, sp nov.
12. *Pantala flavescens* Fabr
13. Cordulegaster pekinensis Selys.
14. *Anotogaster annandalei*, sp. nov.
15. *Anotogaster gregoryi*, sp. nov.
16. *Heterogomphus* sp.
17. Aeschna juncea Linn.
18. Echo incarnata. Karsch
19. *Matrona oberthüri* (Mac-Lāch.)
20. Mnais andersoni (MacLach.)
21. *Mnais gregoryi*, sp. nov.
22. *Mnais maclachlani*, sp. nov.
23. *Caliphaea confusa* Selys.
24. *Anisopleura furcata* Selys.
25. *Rhinocypha iridea* Selys.
26. *Rhinocypha spuria* Selys.
27. *Indolestes coerulea*, sp. nov.
28. *Calicnemis eximia* Selys.
29. *Coenagrion dorothea*, sp nov.
30. *Ceriagrion melanurum* Selys
31. Erythromma tinctipennis MacLach.

Systematic.

Orthetrum japonicum internum Ulh.

Orthetrum japonicum internum Ulh *Proc. Acad. Phila.*, 1858, p. 29.—MacLach., *Ann. Mag. Nat. Hist.* (6) 13, p. 431 (1894).—*O. internum* MacLach., *Ann. Mag. Nat. Hist.* (6) 17, p. 365 (1896),—R. Martin, *Mission Pavie* (p: 7 sep.) (1904).—Morton, *Trans. Ent Soc., Lond.*, p. 305 (1907).

1 ♂ West of Kholitsan, 1 ♀ near Kakatang, 6 ♂ ♂ North of Tasa, 1 ♂ near Chitaung, Valley of Yangtse.

These do not differ from type or from specimens from N.-W. India.

Orthetrum cancellatum Linn. race kraepelini Ris.

Orthetrum cancellatum Linn. race *kraepelini* Ris. *Ann. Soc. ent. Belg.*, 41, p. 45 (1897),—*Id*, *Cat. Coll. Zool.* Selys. Fasc. XI, p. 231 (1909).

1 ♀ South of Taehimpo, 1 ♀ Chitien Region, Valley of Yangtse, 1 pair near Chitsung, Valley of Yangtse and 1 ♂ near Shangkuan.

All specimens badly macerated but the more extensive pale transverse nervures conform to Ris's race *kraepelini*.

Orthetrum triangulare melania (Selys).

Orthetrum triangulare melania (Selys) (*Libella melania*) *Ann. Soc. ent. Belg.*, 27, p. 103 (1883),—Id., (*Libellula melania*) *Compt. Rend. Soc. ent. Belg.* 7, VII, 88 (p. 4 sep.),—Kirby (*Orthetrum melania*) *Cat.*, pp. 39, 182 (1890),—MacLach., *Ann. Mag. Nat. Hist.* (6) 13, p. 432 (1894)—*Id.*, *ibid.* (6) 17, p. 366 (1896).

1 ♂ West of Kholitsan, 1 ♂ West of Lichiang, 1 ♂ near Kakatang, 5 ♂ ♂ near Aiwa in Mekong Valley, 2 ♂ ♂ South of Yeichih, 3 ♂ ♂ South of Puti, 1 ♂ South of Tsehimpo, 1 ♀ North of Chitsung, Valley of Yangtse, 1 ♀ West of Lashihpa.

Do not differ from type. Widely spread throughout China and Japan.

Sympetrum eroticum ardens (MacLach.).

Sympetrum eroticum ardens (MacLach.) (*Thecadiplax ardens.*) *Ann. Mag. Nat Hist.* (6) 13, p. 429 (1894),—*Id.*, *ibid.* (6) 17, p. 364 (1896),—Selys, (*Diplax erotica.*) *Ann. Soc. ent. Belg.*, 27, p. 90 (1883),—Ris, *Cat. Coll. Zool. Selys*, Fasc. XIII, p. 669 (1911).

A single ♀ from near Chitsung, Yangtse Valley. The apices of the wings are hyaline, the bases of all wings saffronated as far as trigones.

Crocothemis servilia (Drur.).

Crocothemis servilia (Drur.) (*Libellula servilia.*) *Ill. ex. Ins.*, i. tab. 47, fig. 6, pp. 112–113 (1770),—Ramb., *Nevr.*, p. 80 (1842),—Brauer (*Erythemis servilia.*) *Novara*, p. 104 (1866),—*Id.* (*Crocothemis servilia.*) *Zool. bot. Wien*, 18, p. 737 (1868). etc.

1 ♂ near Hoching, 1 ♀ near the same place, 1 pair near Shangkuan, 1 ♂ West of Huanglienpu, 2 pairs Salween Valley, 1 ♂ between Lu-chang and Fei-lung, on path above the river Mekong.

These do not differ from type, the maceration has rather hidden their ages.

Palpopleura sexmaculata (Fabr.).

Palpopleura sexmaculata (Fabr.) *Ins.*, 1, p. 338, No. 31 (1787),—*Id.*, *Ent. syst.*, 2, p. 381 (1793),—Burm., *Hdb. Ent.*, 2, p. 860 (1839),—Ramb., *Nevr.*, p. 126 (1842),—Brauer, *Zool. bot. Wien*, 18, p. 716 (1868),—Kirby, *Proc. Zool. Soc., Lond.*, 1885, p. 325,—*Id.*, *Trans. Zool. Soc., Lond.*, 12, p. 273,—*Id.*, *Cat.* p. 9 (1890),—Selys, *Ann. Mus. civ. Genov.* 30, p. 446 (1891),—Calv., *Trans. Amer. ent. Soc.*, 25, p. 92 (1898),—R. Martin, *Mission Pavie* (p. 5 sep.) (1904),—Ris, *Jenaische Denkr.*, 13, p. 331 (1908),—Fabr. (*Aeschna minuta*) *Mantissa Ins.*, i, p. 339, No. 5 (1787),—*Id.*, *Ent. Syst*, 2, p. 385 (1793).

1 ♂ and 2 ♀ ♀ Salween Valley. The females have a small black spot between *Mii and Miii* in all wings just within the level of the inner end of the stigma. This spot is absent in the male.

Diplacodes trivialis (Ramb.).

Diplacodes trivialis (Ramb.) *Nevr.*, p. 115 (1842),—Fabr. (*Libellula braminea*) *Suppl. Ent. Syst.*, p. 284 (1798), —Brauer, (*Diplax trivialis*) *Novara*, p. 104 (1866),—*Id.*, *Zool. bot. Wien*, 17, p. 289 (1867),—Selys, *Ann. Soc. Ent. Belg.*, 27, p. 95 (1883),—Kirby, (*Trithemis trivialis*) *Trans. Zool. Soc., Lond.*, 12, p. 278 (1889),—*Id*, *Proc. Zool. Soc., Lond.*, p. 203 (1893),—Laid. *ibid.*, p. 66, i, (1902),—Karsch, (*Diplacodes trivialis*) *Ent. Nachr.*, 17, p. 246 (1891),—Ris, *Cat. Coll. Selys*, Fasc. XII, p. 468 (1911), etc.

15 ♀ ♀ and 7 ♂ ♂ from the Salween Valley. All true to type. A very common and widespread species from the Seychelles to the Philippines and throughout the oriental region.

Brachydiplax yunnanensis, sp. nov.

3 ♂ ♂ and 5 ♀ ♀ Yeichih, in the Mekong Valley, 4 ♂ ♂ and 1 ♀ near Chitsung, Yangtse Valley, 1 ♀ North of Shih-ku, 5 ♀ ♀ near Ho-ching.

Male. Abdomen 24 mm. Hindwing 28 mm.

Head. Labium ochreous; labrum white; face brown, unmarked; frons and vesicle metallic green; occiput black. Back of head and eyes dark reddish brown variegated with bright citron yellow and black.

Prothorax and *thorax* black, dully metallic. Legs black, hind-legs with a row of robust, rather short widely spaced femoral spines.

Abdomen densely pruinosed, almost white. Short and stout, tapering gradually to the anal end.

Wings hyaline, the bases saffronated diffusely as far out as a little distal to the line of the trigones. Pterostigma bicolorous, the costal half deep blackish brown, the posterior half whitish; trigones traversed once in all wings; nodal index $\frac{7\text{-}11}{7\text{-}9}\ \frac{11\text{-}8}{9\text{-}7}$; discoidal field begins with a row of 3 cells and then continues as rows of 2 cells.

Anal appendages black, rather long and curving sharply downward, slightly dilated at the ends.

Genitalia prominent, lamina broad and low, hamules bulky, the base tumid, the hook very short and sharply curved; lobe long and thin.

Female. Abdomen 22 mm. Hindwing 28 mm.

Head. Eyes pale olivaceous yellow with a reddish cap above; labium with the middle lobe black, the lateral bright citron yellow narrowly bordered with black; labrum and face a deeper yellow: frons metallic blue; occiput pale yellow, the rest as for male.

Prothorax and *thorax* pale yellow, the latter with an

obscure brownish humeral stripe and the lateral sutures black above.

Legs black, the coxae, trochanters and anterior femora yellow.

Abdomen bright citron yellow marked with black as follows: A broad dorsal band from the 2nd to 9th segments, the bases and apices of each segment narrowly and the outer borders finely. Segment 1 has a transverse basal band indented apically in the middle line, segments 2 and 3 have each a fine transverse black ridge. Segment 10 very small, entirely yellow.

Anal appendages conical black.

Wings hyaline, the bases palely saffronated, this colour gradually becoming lost as far as the node, pterostigma brownish, the costal and posterior borders broadly blackish; trigones traversed once in all wings; nodal index $\frac{8\text{-}11}{7\ \ 8}\ \frac{9\text{-}8}{7\text{-}9}$.

The low lying lamina of the genitalia separates this species from *B sobrina*, whilst the large number of antenodal nervures and the very extensive basal marking of the wings separates it from all other species.

Pantala flavescens Fabr.

Pantala flavescens Fabr. *Suppl. Ent. syst.*, p. 285 (1798),—Hagen, *Syn Neur. N. Amer*, p. 142 (1851),—Palisot de Beauvais, *Ins. Afr. Amer.*, p. 69, tab. 3, fig. 4 (1805),—Ramb. (*Libellula viridula*), *Nevr.*, p 38 (1842),—Burm. (*Libellula analis*) *Handb. Ent.*, 2, p. 852 (1839),—*Id.*, *ibid* (*Libellula terminalis*), 2, p. 852 (1839),—Kirby, (*P. flavescens*) *Cat.*, p. 1 (1890),—Ris *Cat. Coll. Selys*, Fasc. XV, p. 917 (1913), etc.

1 ♀ South of Puti, 3 ♂♂ South of Tsehimpo, 5 ♂♂ and 12 ♀♀ Chitien Region, Yangtse Valley.

A cosmopolitan species much given to migration.

Anotogaster annandalei, sp. nov.

(Figs. 1 and 1a.)

A single ♂ from West of Pungtzula.

Male. (Female unknown). Abdomen 55 mm. Hindwing 44 mm.

Head. Eyes pale olivaceous brown; labium ochreous; labrum bright citron-yellow bordered with black and with a median prolongation of the black at the base; lower epistome dark brown, the upper bright yellow with a pale brown centre; frons golden brown, darker above; occiput raised, yellow fringed with long black hair.

Prothorax black, the posterior lobe with a lateral yellow spot.

Thorax black with a greenish yellow antehumeral stripe on the dorsum broader above than below. Laterally greenish yellow with a broad black stripe between the two lateral sutures marked above and below with two small yellow spots. Legs entirely black.

Wings entirely hyaline; pterostigma dark brown; all trigones traversed once, subtrigones entire; nodal index $\frac{13\text{-}17}{14\text{-}12}$ $\frac{17\text{-}13}{12\text{-}14}$; loop 7 cells; pterostigma 2–3 mm. long.

Abdomen black marked with yellow as follows: second segment with a subdorsal spot just behind the jugum on either side and a lateral spot below it, apically a

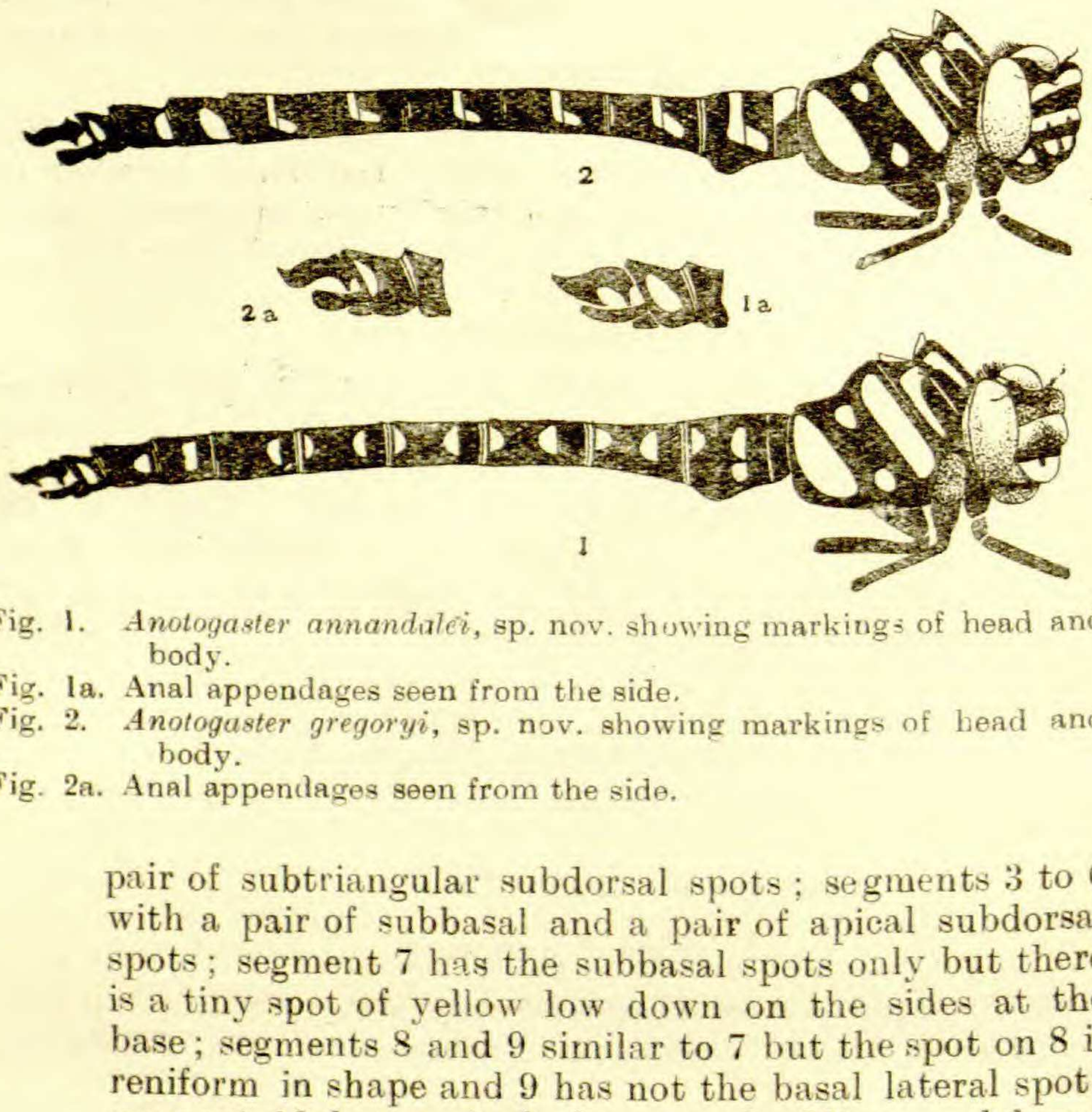

Fig. 1. *Anotogaster annandalei*, sp. nov. showing markings of head and body.
Fig. 1a. Anal appendages seen from the side.
Fig. 2. *Anotogaster gregoryi*, sp. nov. showing markings of head and body.
Fig. 2a. Anal appendages seen from the side.

pair of subtriangular subdorsal spots; segments 3 to 6 with a pair of subbasal and a pair of apical subdorsal spots; segment 7 has the subbasal spots only but there is a tiny spot of yellow low down on the sides at the base; segments 8 and 9 similar to 7 but the spot on 8 is reniform in shape and 9 has not the basal lateral spot; segment 10 has a single large oval oblique subdorsal spot. Segment 1 unmarked.

Anal appendages. Superior with a robust spine at the base beneath and a second one beneath the apex which is strongly pointed.

Differs from the following (*Anotogaster gregoryi*) by segment 1 being unmarked and segments 2 to 6 being

spotted instead of striped. From *Anotogaster basalis* and *nipalensis* by the abdomen being spotted instead of striped.

Anotogaster gregoryi, sp. nov.

(Figs. 2 and 2a.)

A single male from near Chitsung, Valley of Yangtse and a single female from near Kakatang.

Male. Abdomen 58·5 mm. Hindwing 46 mm.

Head Eyes brownish; labium brownish yellow; labrum black enclosing 2 large transverse oval yellow spots; lower epistome black, upper black traversed by a broad yellow stripe which is invaded by the black as two small indentations below; frons black, the crest bright yellow; occiput raised in a thin ridge, black, fringed with black hairs

Thorax black marked with greenish yellow exactly as in the last species. Legs black, the posterior femora with a row of very short, very closely set, robust spines.

Abdomen black marked with greenish yellow as follows: Segment 1 with the dorsum broadly, the marking expanding apically, segments 2 to 7 with yellow annules which cross the dorsum just behind the jugal suture and below turn abruptly and obliquely forward; segment 8 has a large lateral subbasal spot; segment 9 a smaller basal spot and 10 an oblique oval apical spot.

Anal appendages. The superior with only a basal spine, the apex tapering and without a spine beneath. Inferior shorter and broader than that of *A. annandalei.*

Wings slightly and uniformly saffronated but rather more deeply along the costal borders. The extreme apices slightly enfumed.

Trigones in forewings traversed once, in hindwing entire; subtrigones entire.

Nodal index— $\frac{10\text{-}16}{10\text{-}11}$ $\frac{17\text{-}17}{12\text{-}10}$; pterostigma dark brown, 3–4 mm. long.

Female. Abdomen 58 mm. (without ovipositor). Hindwing 50 mm.

Similar to the male in most respects. Wings are similar but *there is no basal marking.* Costa black outwardly, yellow inwardly; nodal index $\frac{13\text{-}19}{14\text{-}14}$ $\frac{19\ 15}{13\text{-}14}$; apices not enfumed. Membrane white; trigones of forewing with 2–3 cells, that of the hind with 2 only.

Abdomen similar to the male but apical transverse spots on segments 2 and 3 (from 2 to 6 in the male)

segment 9 has a narrow basal line and 10 is entirely unmarked.

Ovipositor 9 mm. in length, black.

Differs from *A. annandalei* as mentioned above, from *A. nipalensis* and *A. basalis* by the wings not being saffronated at the base in the female. From the male of *A. basalis* by the rings on the abdomen being much more narrow and prolonged forward below. Lastly from the male of *A. nipalensis* it is distinguished by the brightly contrasted markings of the face.

Heterogomphus sp.

(Fig. 3.)

A single female from West of Lichiang. (In bad condition.)

Female. Abdomen 47 mm. Hindwing 40 mm.

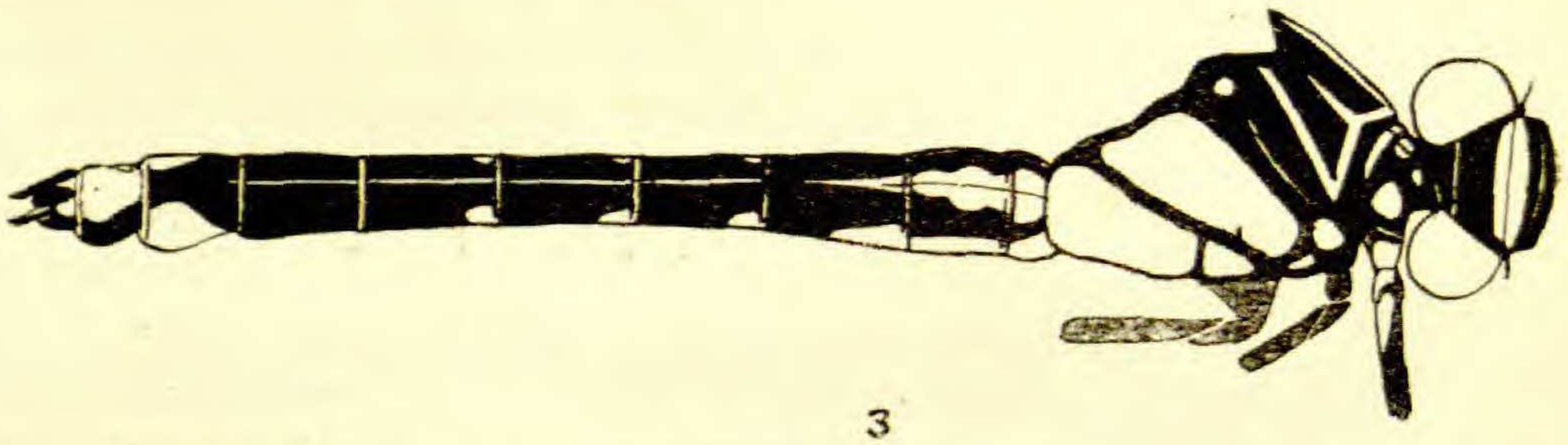

Fig. 3. *Heterogomphus*, sp. showing markings of head and body.

Head. Labium with lateral lobes bright yellow, the middle black; labrum and face entirely black; frons traversed broadly in front and above with yellow; occiput black, raised into a thin yellow lamina behind fringed with long black hairs. The lamina pointed at its centre.

Prothorax black marked with yellow as follows: A geminate spot at its centre with two smaller spots on either side of it in front, a thin collar in front and a stripe across the posterior lobe behind. Lastly a large lateral spot.

Thorax black marked with yellow as follows: A complete mesothoracic collar joined to an oblique dorsal band on either side and to a fine medial line on the mid-dorsal carina. Antehumeral stripes represented by an upper spot and a fine line below the spot. Laterally yellow, the postero-lateral suture mapped out in black.

Legs black, long and robust, a lateral band of yellow

on the first pair of femora and the coxae coloured the same. Hind femora with a row of very short widely spaced spines.

Abdomen black, marked with yellow as follows: The sides of segments 1 and 2 and basal half of 3 broadly, the dorsum of segment 1 with a broad quadrate spot, a trilobed one on the dorsum of 2 which is continued as a tapering mid-dorsal line on 3 to 7, segment 9 has a large subtriangular dorsal spot with its apex point-basalwards, segments 4 to 7 have small gradually decreasing spots low down on the sides at the base of the segments whilst 8 has a very large lateral spot rather diffuse and bordered with yellowish brown. Segment 9 is bordered narrowly with yellowish brown whilst 10 has a pair of small dorsal basal spots. Segments 7, 8 and 9 are broadened laterally.

Anal appendages small conical black.

Vulvar scale very tiny, deep shiny black, bifid at apex and deeply grooved.

Wings hyaline; nodel index $\frac{13\ 15}{12\text{-}10}\ \frac{13\text{-}14}{10\text{-}13}$; no basal nervure of the second series, all trigones, subtrigones and hypertrigones entire: 5–6 rows of postanal cells; 3 rows of cells between *Mi* and *Mia*, pterostigma very long, dark brown. Two transverse nervures between *Mi–iii* and *Miv* in forewing, only 1 in the hindwing.

The specimen is fully adult as the wings are uniformly enfumed.

The species is evidently closely allied to *H. risi* and *H. bicornutus* but is easily distinguished by the armature of the occiput.

Matrona oberthuri (MacLach.).

(Fig. 4.)

Matrona oberthuri (MacLach.) *Ann. Mag. Nat. Hist.*, 6, No. 77, XLVI, May (1894).

3 ♂♂ South of Lichiang, 1 ♀ near Chienchuan Chou.

Male. Abdomen with appendages 54 mm. Hindwing 39 mm.

Eyes blackish brown. Head, thorax and abdomen green metallic with a golden or coppery reflex. The lower epistome is a brilliant golden bronze. Legs black, very long and slim, tibial and femoral spines slim and very long.

Anal appendages black, narrow and subcylindrical in the basal half, flattened and dilated somewhat in the apical half, furnished with a number of short spines on the outer border, the apices curving in and downwards,

nearly meeting. Inferior appendages much shorter, cylindrical, tapering, apices blunt.

Wings broad and spacious, deep blackish brown except the outer fifth of the forewing and a much smaller area in the hind which is paler and only palely enfumed. In the second male the outer fourth of forewing and outer fifth of the hind exhibit this hyaline area, the clear area in the forewing being much better defined than in the hind. Pterostigma absent in all wings, reticulation very close, 55 antenodal nervures and 116 postnodals in one forewing; basal space reticulated, this

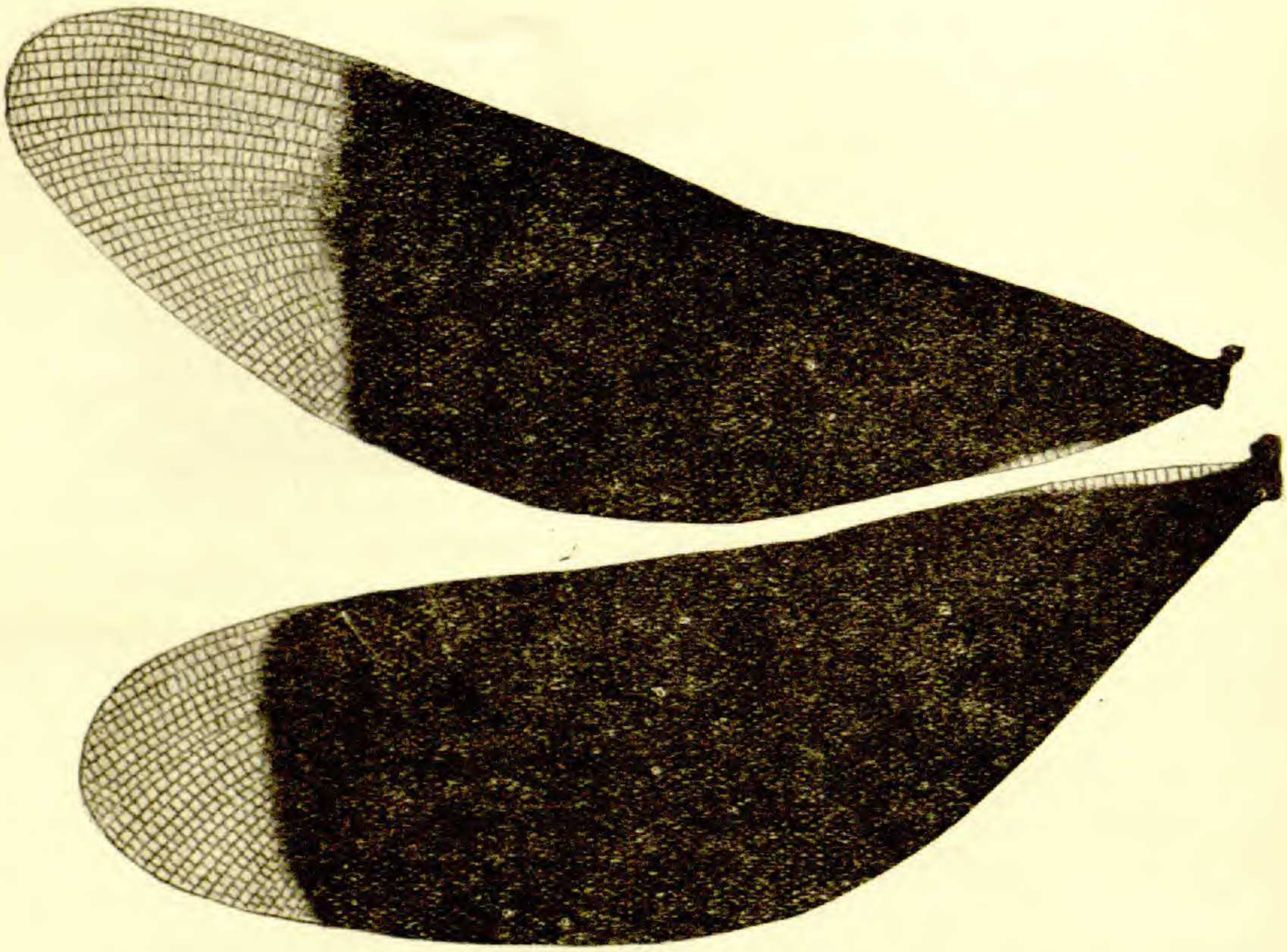

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Fig. 4. Wings of *Matrona oberthuri* MacLach.

forming a network near the arc; trigones with 17-20 transverse nervures; basal-radial space open.

All transverse nervures proximal to the node are pale bluish white, this being more pronounced than in *M. basilaris*.

This species is closely allied to *M. basilaris* and *M. nigripectus*. It may be distinguished from both by the hyaline apices of the wings, although I have recently seen some specimens of the latter species from the Chin Hills in which there was also a distinct indication of

clear areas at the apices of the forewings. The basal nervures in these were not however bluish white as in *oberthuri*.

The single female received is very similar to the male. The inner three-fourths of all wings are dark brown the outer fourths pale brown. There is a tiny, white rudimentary pseudostigma in all wings, so small as to be hardly noticeable. It would be better to say that at the site of the normal stigma there is a slight divergence of the radius and costa, which enclosed area is palely white and traversed by about 4–5 nervures. The borders of all wings are finely margined with dark brown. (End of abdomen missing.)

I have no doubt that this insect and MacLachlan's *Calopteryx oberthuri* are one and the same. The descriptions agree as also do the measurements. The type specimen was taken further to the north, in Szechuen, but I cannot say where it reposes at present as I do not remember seeing it in the MacLachlan collection when looking through the latter in 1920.

Mnais gregoryi, sp. nov.

(Fig. 5.)

2 ♂ ♂ near Chitsung, Yangtse Valley

Male. Abdomen 45 mm. Hindwing 38 mm.

Head. Labium black, labrum and rest of head brilliant coppery metallic, the occiput more dully so.

Prothorax and thorax bright coppery metallic, green in some lights, the sides of the thorax low down and the whole of the dorsum pruinosed white as in *M. earnshawi*. The metepimeron olivaceous, non-metallic. Legs black, long and slim; tibial spines long; claws bifid.

Abdomen black, with a coppery reflection, segments 1 to 3 and 8 to 10 pruinosed white.

Anal appendages black, superior cylindrical at the base, flattened thereafter angulated strongly inward near the base, broadening towards the apices, which nearly meet. The outer border finely spined.

Inferior shorter, cylindrical, tapering, the apices curving slightly upward.

Wings hyaline, all traversed by a broad blackish brown fascia which extends from the outer end of the trigone to about half-way to the pterostigma. The inner border of fascia irregular in the forewing, oblique from before back in the hind, the outer border crenulate and very irregular in both wings, prolonged finely along the

costal margin. Pterostigma present in all wings, dark brown, inner end very oblique but not braced, outer end nearly straight, posterior border strongly convex backward Reticulation very close, in some places two rows of cells between the radius and costa, especially is this the case after the stigma; arc at the 3rd antenodal in all wings, 29 antenodal nervures, 41 postnodals in forewing, 27 and 44 respectively in the hind; basal space entire; 12 cubital nervures; trigones traversed six times in forewing, 5 in the hind; sectors of arc springing

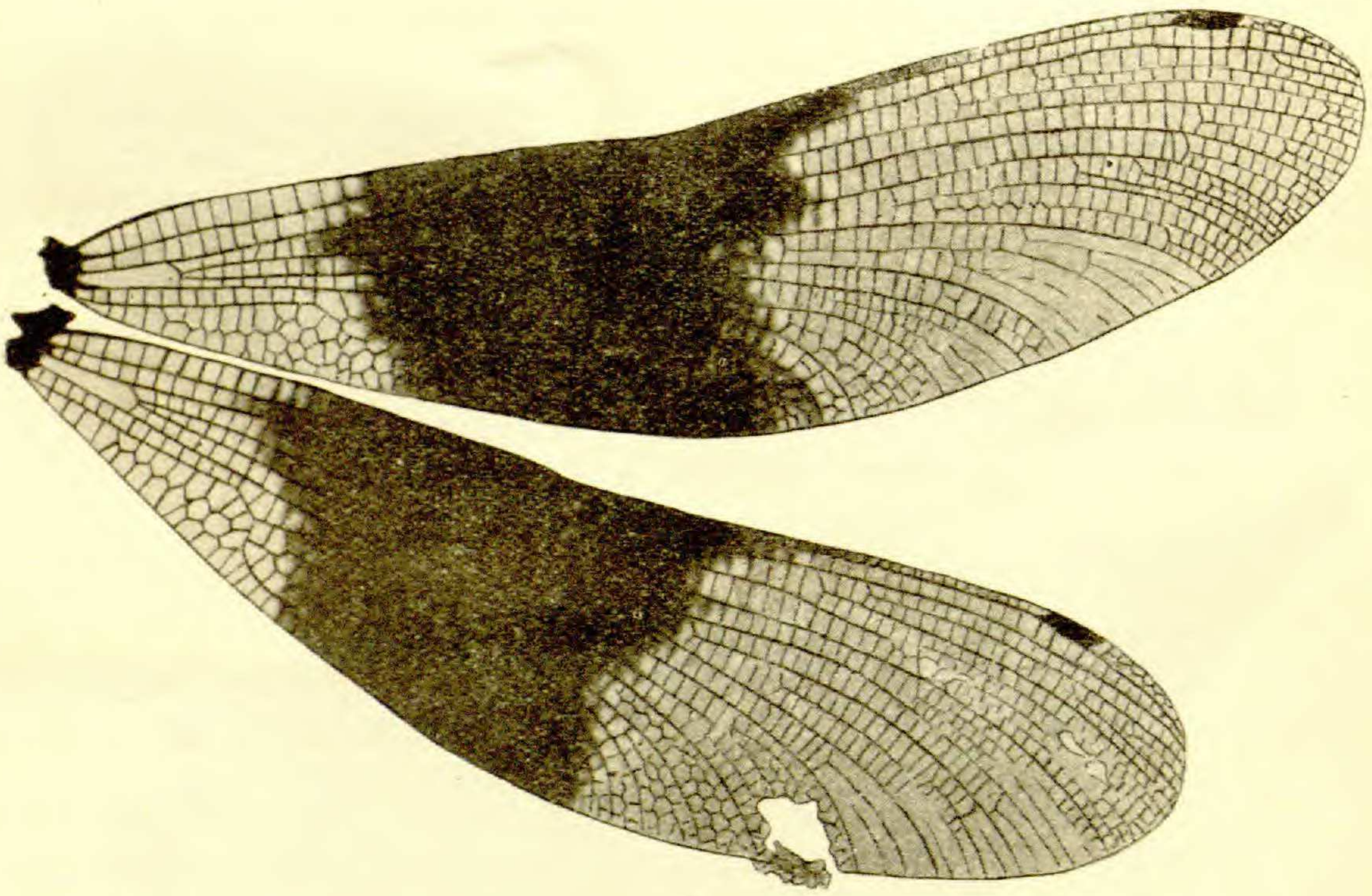

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Fig. 5. Wings of *Mnais gregoryi*, sp. nov.

from slightly below the centre of arc. Basal radial space open.

Bulb of penis very tumid: hamules broad and spreading laterally. Distinguished from other species of *Mnais* by the broad black fasciae completely traversing the wings. The elongate pterostigma and the presence of two rows of cells after this structure place it in the palaearctic group of *Mnais*.

Mnais maclachlani, sp. nov.

(Fig. 6.)

A single male south of Puti.

Male. Abdomen 30 mm. Hindwing 38·5 mm.

Head, thorax and abdomen green or coppery bronze metallic according to the angle of view. Thorax not pruinosed although the specimen appears to be fully adult. Legs, long and slim, black.

Wings hyaline, slightly enfumed, the clouding being blackish, not olivaceous. Pterostigma elongate, squarish outwardly, very oblique inwardly, followed by 2 rows of cells as in the last species. *Cui* ends beyond level of node.

The insect is possibly a local race of *M. andersoni* from which it may be distinguished by the wings not

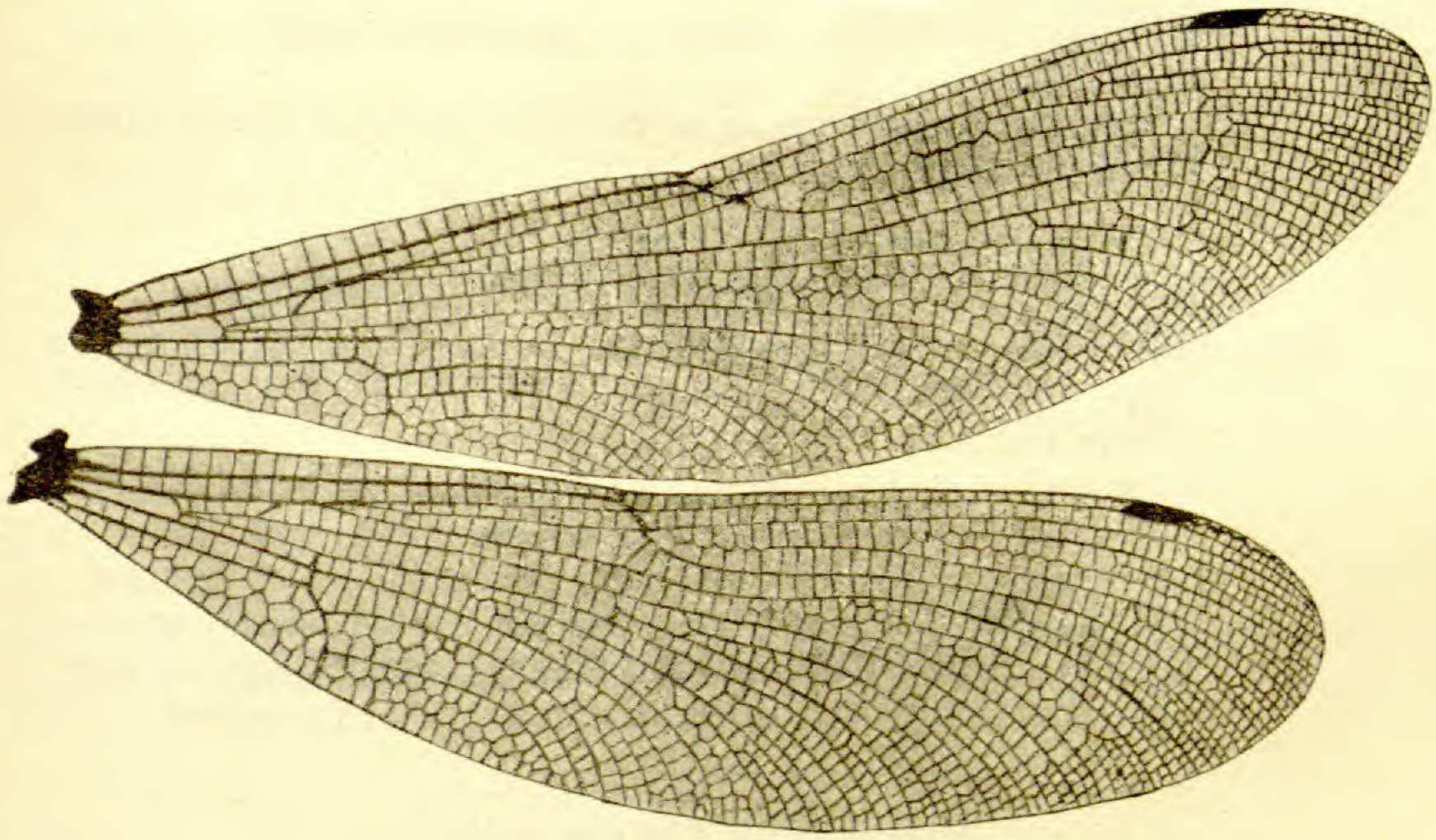

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Fig. 6. Wings of *Mnais maclachlani*, sp. nov.

being of an olivaceous tint, by their much greater length and by the black pterostigma.

Unfortunately the last four segments of the abdomen are missing and Professor Gregory's notes do not give any indication as to whether these were pruinosed or not. He does, however, mention this fact in the case of *M. gregoryi* so that I infer the end segments of the present species were not pruinosed If so this would be an additional peculiarity separating it from *M. andersoni* and *M. pruinosa*.

Caliphaea confusa Selys.

Caliphaea confusa Selys. *Bull. Acad. Belg.*, (2) vii, p 439 (1859), —MacLach. (*Caliphaea consimilis*), *Ann. Mag. Nat.*

Hist , 6th series, No. 77, XLVI (1894),—Id., (*Notholestes elwesii*) *Ent Month. Mag.*, XXIV, p. 31 (1887).

3 ♂ ♂ near Aiwa in the Mekong Valley.

Not differing from type and similar to specimens I have received from Assam. The type is from Nepal. MacLachlan's specimens were from North of Yunnan.

Anisopleura furcata Selys.

Anisopleura furcata Selys., *Ann. Mus. Civ. Genova*, (2) X (XXX), p. 488 (1891),—Williamson, *Proc. U. S. Nat. Hist. Mus.*, XXVIII, p. 181, fig. 13,—Laid. *Rec. Ind. Mus.*, Vol. XIII, p. 31 (1917).

1 ♂ near Aiwa in the Mekong Valley, 1 ♂ South of Puti, 28. vi. 22.

The species has not been recorded further north than Burma so far.

Rhinocypha iridea Selys.

Rhinocypha iridea Selys., *Ann. Mus. Civ. Genov* (2) X (XXX), pp. 492–494 (1891),—Laid. *l.c.*, p. 37 (1917),—Williamson, *l c.*

3 teneral ♂ ♂ 1 adult ♂ and 2 teneral ♀ ♀ at Yung-Chang, on bushes overhanging streams, etc., and between Lu-chang and Fei-lung, on path above the river Mekong.

Originally described from Burma. I have seen specimens from the Chin Hills. The present record is the most northerly limit of its distribution so far noted.

Rhinocypha spuria Selys.

Rhinocypha spuria Selys., *Bull. Acad. Belg.* (2) XLVII, p. 388 (1879),—Williamson, *l.c.*, p. 177 (1905),—Laid., *l.c.*, p. 37 (1917).

A single adult male from Yung-Chang, on bush overhanging stream.

Originally described from the Khasia Hills, has also been recorded from the Chin Hills, Burma. I have seen a good number of examples from Assam from which the present specimen does not differ in any respect.

Indolestes coerulea, sp. nov.

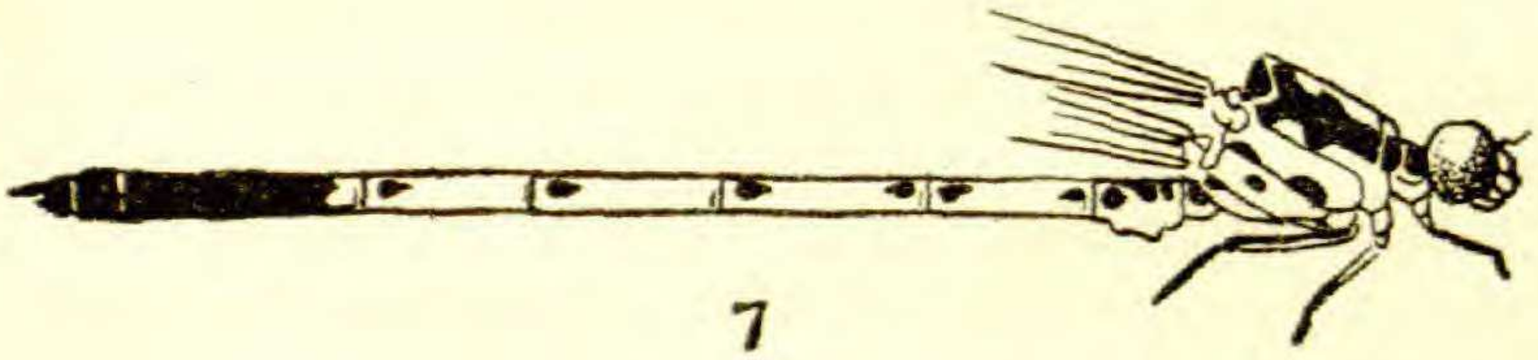
(Figs. 7, 7a and 7b.)

A single female from near Chitsung, Yangtse Valley.

Whole of head except the labrum and epistome matt black ; labrum turquoise blue finely bordered with black ;

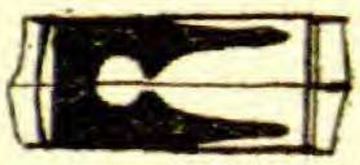
epistome similar; labium whitish. Eyes olivaceous above, bluish green at the sides and below.

Prothorax black on the dorsum, blue at the sides, posterior lobe simple, rounded.



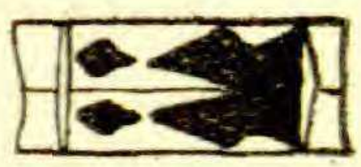
7

7a



8c

8b



7b

8

8a

Fig. 7. *Indolestes coerulea*, sp. nov. showing markings. 7a. Markings of abdomen seen from above. 7b. Markings onsecond abdominal segment seen from above.

Fig. 8. *Coenagrion dorothea*, sp. nov. showing markings. 8a. Markings of abdomen seen from above. 8b. Markings on second abdominal segment seen from above. 8c. Markings on eighth abdominal segment seen from above.

Thorax turquoise blue, the dorsal carina and alar sinus finely yellow, tergum spotted with blue. Dorsum marked with a trilobed band as in *L. praemorsa*, matt black in colour. Laterally an upper and lower spot

on the antero-lateral suture and a small spot of black between and behind these.

Legs yellow, femora black on the extensor surface, the tibiae on flexor surface.

Abdomen turquoise blue, brownish beneath. Marked with black as follows: Segment 1 with a dorsal quadrate spot not extending to the apex and a small spot on either side of it, segment 2 with a dorsal spot constricted in its middle and deeply bifid at its apex which reaches about one quarter of the length of the segment from its apex. At the apex of each of the bifurcations a small diamond-shaped spot, segments 2 and 3 have small subdorsal, subbasal spots and larger subapical subdorsal spots, 5 and 6 similar but without the basal spots, 7 entirely black save for a broad blue basal ring, segments 8 to 10 all black.

Anal appendages black, as also are the ovipositor and vulvar scales. Abdomen 29 mm. Hindwing 16 mm.

Wings uniformly enfumed; pterostigma black, a little more than twice as long as broad, squared at both ends but the inner a little oblique. Postnodal nervures in forewings 12, in the hind 11.

The markings of this species are remarkably similar to those of *Indolestes indica* from Assam but the ground colour in the latter is pale brown. I only know of one other species of *Indolestes* in which the ground colour is blue, a new species from Coorg. In this latter the markings are entirely different both on the thorax and abdomen.

Calicnemis eximia Selys.

Culicnemis eximia Selys., *Bull. Acad. Belg.* (2) XVI, p. 160 (1863), *Id.*, *Mem. Cour.*, XXXVIII, p. 130 (1886), Kirby, *Cat. Odon.*, p. 131 (1890),—Selys, *Ann. Mus. Civ. Genov.* (2) X, p. 72 (1891), Martin, *Mission Pavie* (*Neurop.*) (sep.) p. 18 (1904,—Selys (*Calicnemis atkinsoni*), *Ann. Mus. Civ. Genev.*, (2) X, p. 72 (1891), (♀).

1 pair near Kakatang, 1 ♀ and 3 ♂ ♂ near Aiwa in the Mekong Valley, 2 pairs South of P'uti, 1 ♀ South of Tsehimpo.

Most specimens are teneral, and any variation in the markings are due to this factor.

Coenagrion dorothea, sp. nov.

(Figs. 8, 8a, 8b and 8c.)

2 adult ♂ ♂, 1 teneral ♂ and 1 ♀ from near Shangkuan.

Male. Abdomen 29 mm. Hindwing 22 mm.

Head. Eyes olivaceous green with a darker green cap above; face pale blue marked with black, 3 tiny spots at base of labrum and a transverse line across epistome. Top of head black, with postocular spots of blue.

Prothorax broadly black on dorsum, azure blue at the sides and with a narrow anterior blue collar.

Thorax azure blue, the dorsum broadly black, a narrow humeral line of the same colour and the postero-lateral suture finely. An incomplete line above between the lateral sutures followed by a spot below it.

Legs pale blue, the extensor surfaces broadly black.

Abdomen blue marked with black as follows: Segment 1 with a dorsal basal quadrate spot not extending to the apical border, segment 2 with a wine-glass shaped mark on the dorsum, the base and stem directed apicalwards, segments 3 to 6 with dorsal stripes expanding apicalward and then contracting to join an apical ring, segment 7 black, except for a narrow basal ring and a streak of the ground-colour along the sides, segment 8 with a bifid dorsal marking, the marking complete at the apex of segment where it forms a broad ring, incomplete towards tho base where it ends in two long points. Near the apex, the two pointed parts approach to nearly enclose a small spot of the ground-colour, segment 9 entirely blue, 10 blue on the dorsum. Laterally segments 2 to 7 have longitudinal black stripes low down near the ventral surface and extending the whole length of the segments.

Anal appendages small, narrow at the base, dilating apicalward, armed with a robust inward and downwardly directed apical spine.

Female. Very similar to the male. The blue colour replaced by greenish blue on the face and thorax. Abdomen azure blue as in the male and with broader markings. The goblet marking on the second segment of the male is here filled in and extends as far as the base, segments 8 and 9 are broadly black on the dorsum and 10 is narrowly black at the base. Anal appendages black. Legs bluish-green, marked broadly with black.

Abdomen 26 mm. Hindwing 21 mm. Postnodal nervures 12/10.

The peculiar markings on abdominal segments 2 and 8 in the male will easily distinguish this *Coenagriou* from any other.

Ceriagrion melanurum Selys.

Ceriagrion melanurum Selys., (pars), *Bull. Acad. Belg.* (2) XLII, p. 529 (1876),—MacLach., *Ann. Mag. Nat. Hist.* (6)

XVII, p. 374 (1896),—Krug., *Stett. Ent. Zeit.*, p. 120 (1898),—Kirby, *Cat. Odonata*, p. 154 (1890),—Laid., *Rec. Ind. Mus.*, Vol. XVI, p. 191 (1919).

1 ♂ at Yang-chang, on bushes overhanging stream.

The species is widely distributed from Burma across China to Japan.

The present specimen does not differ from type nor from specimens I have seen from Assam.